CLAIMS

I/W claim:

1. An integrated three dimensional packaging and cooling system for cooling an electronic component system with dissimilar power densities and interfering signals, the electronic component system including a first electronic component with a first signal type and a second electronic component with a second signal type, wherein the first signal type interfere with the second signal type, the system comprising:

a system framework with at least one electronic connector mounted thereto, the at least one electronic connector including system input connections and system output connections, the system framework comprising:

a system housing;

a first circuit card cavity configured to house a first circuit card with the first electronic component mounted thereon;

a second circuit card cavity configured to house a second circuit card with the second electronic component mounted thereon;

a first signal shield between the first circuit card cavity and the second circuit card cavity, the first signal shield disposed to shield the first electronic component from receiving an interfering second signal type from the second electronic component; and

a thin-film evaporative spray cooling system comprising:

a first spray module configured to provide spray cooling to the first circuit card;

a second spray module configured to provide spray cooling to the second circuit card;

wherein each of the first spray module and the second spray module comprise a plurality of atomizers in fluid receiving disposition to receive cooling fluid from a system cooling fluid supply, and each of the plurality of atomizers are oriented to spray cooling fluid on the circuit card corresponding to that spray module.

2. An integrated three dimensional packaging and cooling system as recited in claim 1, and wherein the first spray module is integral with the second spray module and further wherein the plurality of atomizers of the first spray module spray cooling fluid in the opposite direction from cooling fluid sprayed by the plurality of atomizers in the second spray module.

3. An integrated three dimensional packaging and cooling system as recited in claim 2, and further wherein the integral first spray module and second spray module also comprise the first signal shield.

4. An integrated three dimensional packaging and cooling system as recited in claim 1, and further wherein the first spray module is one of: a normal impingement type; an angled impingement type and a transverse spray type.

5. An integrated three dimensional packaging and cooling system as recited in claim 1, and further wherein the first spray module is dissimilar to the second spray module.

6. An integrated three dimensional packaging and cooling system as recited in claim 5, and further wherein the second spray module is one of: a normal impingement type; an angled impingement type and a transverse spray type.

7. An integrated three dimensional packaging and cooling system as recited in claim 1, and further wherein the spray module is also the first signal shield.

8. An integrated three dimensional packaging and cooling system as recited in claim 1, and further wherein the first signal type is digital and the second signal type is analog.

9. An integrated three dimensional packaging and cooling system as recited in claim 1, and further wherein the first signal type is digital and the second signal type is radio frequency.

10. An integrated three dimensional packaging and cooling system as recited in claim 1, and further wherein the first signal type is analog and the second signal type is radio frequency.

11. An integrated three dimensional packaging and cooling system as recited in claim 1, and further wherein the first signal shield is an electromagnetic-interference attenuating shield.

12. An integrated three dimensional packaging and cooling system as recited in claim 1, and further comprising:

a third circuit card cavity configured to house a third circuit card with a third electronic component mounted thereon, the third circuit card cavity being oriented to house the third circuit card approximately parallel relative to the first circuit card;

a second signal shield between the second circuit card cavity and the third circuit card cavity, the second signal shield disposed to shield the second electronic component from receiving an interfering third signal type from the third electronic component; and

wherein the thin-film evaporative spray cooling system further comprises a third spray module configured to provide spray cooling to the third circuit card, and further wherein the third spray module comprises a plurality of atomizers in fluid receiving disposition to receive .cooling fluid

from a system cooling fluid supply, and each atomizer is oriented to spray cooling fluid on the third circuit card.

13. An integrated three dimensional packaging and cooling system as recited in claim 12, and further wherein the first signal shield is an electromagnetic-interference attenuating shield.

14. An integrated three dimensional packaging and cooling system as recited in claim 12, and further wherein the second spray module is integral with the third spray module and further wherein the plurality of atomizers of the second spray module spray cooling fluid in the opposite direction from cooling fluid sprayed by the plurality of atomizers in the third spray module.

15. An integrated three dimensional packaging and cooling system as recited in claim 12, and further wherein the integral first spray module and second spray module also comprise one of the first signal shield and the second signal shield.

16. An integrated three dimensional packaging and cooling system as recited in claim 12, and further wherein the third spray module is one of: a normal impingement type; an angled impingement type and a transverse spray type.

17. An integrated three dimensional packaging and cooling system as recited in claim 12, and further wherein the first spray module is dissimilar to the third spray module.

18. An integrated three dimensional packaging and cooling system as recited in claim 12, and further wherein the second spray module is also the second signal shield.

19. An integrated three dimensional packaging and cooling system as recited in claim 12, and further wherein the first signal type is digital and the third signal type is analog.

20. An integrated three dimensional packaging and cooling system as recited in claim 12, and further wherein the second signal type is digital and the third signal type is radio frequency.

21. An integrated three dimensional packaging and cooling system as recited in claim 12, and further wherein one of the first signal shield and the second signal shield is an electromagnetic-interference attenuating shield.